

Abstract

The invention relates to a three-phase linear synchronous motor with an armature having an axial bore through the middle, into which the optical element – for example an optical lens – can be installed. The armature comprises a sliding sleeve inside which an axially polarized permanent magnet with an unobstructed center bore is located. The armature is guided inside a stationary outer sheath. The armature is displaced by interaction between the permanent magnet and a magnetic field that is moved along the optical axis. The traveling field is generated by at three adjacent stator coils wound around the outer sheath and each having a separate and variable supply of current. The position of the armature is defined by self-holding forces of the permanent magnet in the magnetic field of the coils. The traveling wave magnetic field and hence the armature can be axially displaced with as much precision as desired. The track of the armature can be made as long as desired by changing the number of coils. The system is suitable for miniaturization of optical systems.

(Fig. 1)